Forest Insect Conditions on the Teton National Forest and in Grand Teton National Park 1967

The following is an evaluation of current forest insect problems on the Teton National Forest and Grand Teton National Park in 1967. Since the major forest insect problem--the mountain pine beetle--is actually one infestation and common to both the Forest and Park, we have consolidated the evaluation into a single report, instead of preparing separate reports as has been done in the past. Material for this report was compiled from previous evaluation reports, from aerial survey maps and data, from special evaluation surveys and from less intensive examinations of other insect problems on the Forest and Park this year.

The principal forest insect problems in 1967 were the mountain pine beetle, which is epidemic on both the Forest and Park, and the spruce budworm and the sugar pine tortrix which occur primarily in the Forest. Briefly, mountain pine beetle populations are on the decline with the Wilderness Area showing the largest single decrease. Less spectacular but significant decreases occurred in the Hoback drainage, on adjacent State, private, and BLM land near Kismet Peak and in lodgepole stands surrounding Two Ocean and Emma Matilda Lakes in the Park. The Forest will continue to experience a general decline in 1968 while static losses will continue in the Park. Spruce budworm activity was reported for the first time near the tri-Forest area in the southwest corner, but damage is neither severe nor extensive enough to warrant suppression. Sugar pine tortrix populations are still present but creating only minimal damage to lodgepole pine in one small area. A more detailed and comprehensive discussion of these insect problems follows.

Mountain pine beetle, Dendroctonus ponderosae

Mountain pine beetle populations continue to deplete the lodgepole pine resource in many areas of the Teton National Forest and Grand Teton National Park. Aerial survey data show little change in infestation boundaries but a marked change in outbreak intensity. Serious but reduced tree killing persists in Grand Teton National Park, in the Teton Wilderness of the Teton National Forest and in most of the larger tributaries of the Hoback drainage. Considerably smaller but nevertheless important infestations continue to kill lodgepole pine in the Buffalo, Blackrock and Gros Ventre drainages, around Antelope point, in Coulter and Rodent Creeks near Yellowstone National Park and in Fall and Coburn Creeks across from the mouth of the Hoback. All of these and other infestations are shown on a copy of the aerial survey map mailed to the Forest earlier.

Generally, mountain pine beetle populations are on the decline in most of the known infestation areas. The greatest and most significant reduction in the number of beetle killed trees occurred in the Teton Wilderness. The almost continuous "sea" of red topped trees that was so prevalent in 1965 and 1966, diminished to a far less spectacular level this year. Aerial survey observers also noted a significant reduction in the number of faded trees in the Buffalo River drainage and in the lower reaches of

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the wilderness. It is these areas that have the longest history of mountain pine beetle activity. The most active populations are in the uppermost drainages of the wilderness, and have already begun to exhaust themselves. Of these, the most active infestation in the wilderness, or in the Forest for that matter, is in the upper portion of Pilgrim Creek and along the wilderness boundary into Arizona and Bailey Creek. All of these areas are on the decline, however, and although not apparent until this year, they have been decreasing steadily since 1965, the year of peak killing.

Overall the mountain pine beetle populations on the Teton National Forest are now on the decline and will continue to recede even further in 1968. There are undoubtedly some areas that will show a definite increase, and this is to be expected, but the general infestation level is lower than it has been for the last two years and will probably continue to drop even lower in the future. Although there is considerable host material still available along the lower stretches of the wilderness, the infestation has apparently run its course. There will continue to be some tree killing in these and other areas, but considerably under the catastrophic level experienced in recent years.

A less significant but important decrease in the number of beetle killed trees occurred in the Hoback Drainage in the southern end of the Teton National Forest. The most marked decline occurred just outside the Forest boundary on BLM, state and private holdings surrounding Kismet Peak and Signal Hill. In most of the areas sampled, the beetles have moved into smaller diameter trees, group sizes have declined, Ips populations have increased and will preclude successful mountain pine beetle development in some areas, woodpecking has increased compared to last year, and pitchouts are more prominent, all of which indicate a downward trend. Newly attacked trees were virtually impossible to find and it is this area that contained upward of 50,000 infested trees just two years ago. Like the wilderness situation, this infestation started its receding trend in 1965. This is probably one of the most heavily depleted lodgepole stands in the Region today.

In adjoining Teton National Park considerably fewer trees were killed this year and last by the mountain pine beetle than in any of the previous periods of heavy attack. Control efforts were terminated in 1966 in most of the park; it is doubtful whether the control work suppressed the beetles capacity for increase or materially changed the conditions which are responsible for the outbreak in the first place - the maintenance of contiguous mature and overmature stands of lodgepole pine. The mountain pine beetle is an integral part of the forest community and as long as sufficient host material remains, tree killing will continue.

On both the National Forest and National Park tree killing will continue in 1968 but somewhat less than in 1967 since the entire infestation is experiencing a general decline. Considering this and the low attack density, control should be limited to infestation groups of five or more trees. Present indications are that all control may be terminated by July 15, 1968.

Teton 1967

During the course of our routine biological evaluations, we incorporated prism cruising as one method of measuring existing stand structure. Eight individual cruises, entailing some 12 man days of effort, were run near and inside the wilderness boundary from Turpin Meadow to Arizona Creek. The infestation in Arizona Creek is still in progress, but shows a declining trend. The mountain pine beetle has passed through most of the other areas and newly attacked trees were difficult to find. The results of these surveys are shown in Table I.

We realize that this data is cursory and does not lend itself to statistical manipulation, nor was it meant to, but it does provide us with information we have not had before. If nothing else, our observations permitted us to draw some general conclusions, however fragmentary, on beetle activity and stand conditions, namely:

1. The infestation in the lower fringe of the wilderness is definitely on the decline. Some crews spent the better part of a day looking for a minimum number of trees to sample. The decline started in 1965 and has continued steadily downward since then.

2. The stands are composed of mixed species, with lodgepole pine the dominant species.

3. Only a very small proportion of the stand consists of lodgepole 15 inches and larger, either live or dead.

4. The stands are understocked now and were understocked prior to the beetle epidemic.

5. In the course of several consecutive years of massive beetle attack, a high but not extreme proportion of the lodgepole pine has been killed. In those areas where the beetle has run its course, the stands are far from depleted, nor has all or even most of the sawtimber been lost.

6. Although the beetle shows preference for the larger trees, trees of lesser diameter are also attacked, but not proportional to their occurrence in the stand.

Biological data to determine the trend of the mountain pine beetle infestation was taken in many areas of the Forest, Park, and neighboring lands. Evaluation methods have been changed from those used in previous years. Far less reliance is put on fall brood counts and greater emphasis placed on other biological factors, including current attack ratios, which more accurately depicts present trend. The fall brood count sequential sampling method has not given us the right answers. Using that method, in areas where increased conditions were predicted, decreases occurred; similarly, where decreases were called for, increases occurred. These inconsistencies were Region-wide and have been accumulating for a number of years now. We suspected this last year, and although we lacked definite data to prove otherwise, we nevertheless tempered our evaluations with empirical judgment. We continue to make

Pacific Creek #1	8	56.0	1.0	-	
20 Plots	10	30.6	9.9	-	40.5 Teton 1967
Total live	12	9.6	13.2	1.8	24.6
BA/A=63 sq. ft.	14	4.0	12.5	1.5	18.0
	16	2.0	3.2	0.4	5.6
	16	-	0.3	0.9	1.2
	Total	102.2	46.1 30	4.6	152.9
Pacific Creek #2	8	127.6	17.4	-	145.0
10 Plots	10	41.4	30.6	-	72.0
Total live	12	9.1	33.8	-	42.9
BA/A=74 sq. ft.	14	-	8.1	-	8.1
	16	-	0.7	-	0.7
	16	-	-	-	0.0
	Total	178.1	90.6 34	-	268.7
Pilgrim Creek #1	8	53.2	-	4.2	57.4
20 Plots	10	30.6	6.3	1.8	38.7
Total live	12	9.0	6.0	-	15.0
BA/A=66 sq. ft.	14	5.0	2.5	1.0	8.5
	16	0.4	0.4	-	0.8
	16	-	-	-	0.0
	Total	98.2	15.2 13	7.0	120.4
Pilgrim Creek #2	8	53.2	-	8.4	61.6
20 Plots	10	36.0	2.7	1.8	40.5
Total live	12	13.2	3.0	3.6	19.8
BA/A=70 sq. ft.	14	4.0	1.5	3.5	9.0
	16	1.2	0.4	2.8	4.4
	16	-	-	-	0.0
	Total	107.6	7.5 6	20.1	135.3
[illegible] Creek	8	19.6	1.4	12.6	33.6
Plots	10	9.9	10.8	11.7	32.4
Total live	12	12.6	8.4	9.0	30.0
BA/A=139 sq. ft.	14	4.5	7.5	6.5	18.5
	16	1.2	2.4	5.6	9.2
	16	-	-	5.4	5.4
	Total	47.8	30.5 24	50.8	129.1
Turpin Meadows	8	47.6	15.4	-	63.0
20 Plots	10	18.9	13.5	3.6	36.0
Total live	12	9.6	9.6	2.4	21.6
BA/A=66 sq. ft.	14	1.5	5.5	2.0	9.0
	16	0.8	2.4	3.6	6.8
	16	-	-	2.1	2.1
	Total	78.4	46.4 33	13.7	138.5

* Douglas-fir, subalpine fir, Engelmann spruce and white bark and/or limber pine.

TABLE I

MOUNTAIN PINE BEETLE VARIABLE PLOT CRUISE DATA (BAF10)
TETON NATIONAL FOREST 1967

Areas Sampled	Diameter Class (in.)	Number of Trees Per Acre			
		Live Lpp	Dead Lpp	Other Species* (Live)	Total All Species
Arizona Creek #1	8	69.6	12.6	17.4	99.6
10 Plots	10	41.4	7.8	3.6	52.8
Total live	12	39.0	2.7	5.2	46.9
BA/A=106 sq. ft.	14	11.7	0.7	0.9	13.3
	16	-	-	0.7	0.7
	16	-	-	1.2	1.2
	Total	161.7	23.8 11	29.0	214.5
Arizona Creek #2	8	79.8	1.9	7.6	89.3
15 Plots	10	49.2	4.8	12.0	66.0
Total live	12	16.0	1.6	3.6	21.2
BA/A=92 sq. ft.	14	4.2	4.2	1.8	10.2
	16	1.0	0.5	1.5	3.0
	16	-	0.4	0.8	1.2
	Total	150.2	13.4 7	27.3	190.9
Pacific Creek #1	8	56.0	7.0	-	63.0
20 Plots	10	30.6	9.9	-	40.5
Total live	12	9.6	13.2	1.8	24.6
BA/A=63 sq. ft.	14	4.0	12.5	1.5	18.0
	16	2.0	3.2	0.4	5.6
	16	-	0.3	0.9	1.2
	Total	102.2	46.1 30	4.6	152.9
Pacific Creek #2	8	127.6	17.4	-	145.0
10 Plots	10	41.4	30.6	-	72.0
Total live	12	9.1	33.8	-	42.9
BA/A=74 sq. ft.	14	-	8.1	-	8.1
	16	-	0.7	-	0.7
	16	-	-	-	0.0
	Total	178.1	90.6 34	-	268.7
Pilgrim Creek #1	8	53.2	-	4.2	57.4
20 Plots	10	30.6	6.3	1.8	38.7
Total live	12	9.0	6.0	-	15.0
BA/A=66 sq. ft.	14	5.0	2.5	1.0	8.5
	16	0.4	0.4	-	0.8
	16	-	-	-	0.0
	Total	98.2	15.2 13	7.0	120.4

brood counts, however, for they still tell us things about the population that we could not obtain otherwise, namely, the presence or absence of brood, their development and apparent physiological condition, as well as the presence and relative abundance of parasites, predators and associated beetles--to name a few. Supplementing this data were measurements of stand composition and depletion, attack density, and pitchout and attack ratios. The following table (II) summarizes the quantitative data taken during the evaluation survey.

TABLE II

Location	Area	Attack Ratio 1966	Attack Ratio 1967	Average Fall Brood Density/Sq.Ft.	Trend*
Teton N.F.	Arizona Creek	1	1.3	226	Increasing
	Carpenter Drain.	No new attacks found			-
	Rosies Ridge 1/	1.1	1	232	Static
	Four Mile	1.8	1	130	Decreasing
	Pacific Creek #1	No new attacks found			-
	Pacific Creek #2	No new attacks found			-
	Box Creek	Only one new attack found			-
	Turpin Meadow	Only one new attack found			-
	Flagstaff Creek	1.6	1	216	Increasing
	Lower Slide Lake	1	1.7	100	Decreasing
	Fall Creek	1	1.1	218	Increasing
	Little Granite Cr.	1	1.4	240	Increasing
	Dell Creek	1	1.3	287	Increasing
	Jackpine Creek	1.3	1	306	Increasing
	No. Fk. Fisherman Cr.	1.7	1	133	Decreasing
	Kilgore Creek	1.5	1	249	Increasing
	Average	1	1		
Grand Teton N.P.	Two Ocean Lake	2.5	1	268	Increasing
	Signal Mountain	1.4	1	193	Increasing
	Pot Holes	1	1.2	73	Decreasing
	Timber Island	1	1.4	408	Increasing
	Stewart Drainage	1	1.3	286	Increasing
	Average	1	1.1		
BLM	Kismet Peak	18	1	59	Decreasing

* Determined from Sequential Sample Tables

Care should be exercised in placing undue confidence in any specific evaluation and projecting it as being representative of a larger area or particular condition. In many areas of the forest and park, because of the extremely low attack densities, newly attacked trees were difficult to find. Many of the above attack ratios, for instance, were compiled from

1/ This area could actually be decreasing since comparisons were made in an area where last year's trees had been felled and burned.

less than 50 trees, including both new and old attacks, and after several hours search in each area.

Spruce budworm, Choristoneura occidentalis

The aerial survey team detected for the first time the occurrence of discernible spruce budworm activity on the Teton National Forest. Feeding damage was confined to one small area in the southwest corner of the Forest. Light defoliation occurred in lower Horse Creek and farther south from Martin and Sawpit Creeks to the Bailey Creek-Snake River confluence on the Bridger National Forest. Total defoliated area is approximately 2,900 acres with Douglas-fir, subalpine fir, and Engelmann spruce the principal hosts. Most of this area is relatively inaccessible.

Egg mass data, which reflects the trend of the budworm population and subsequent damage, was taken from strategic portions of the infestation on the adjoining Bridger and Targhee National Forests. Negligible to light defoliation will continue in 1968 in all of the present infestation areas on the Teton National Forest with the possibility of some movement into the smaller drainages north and east of Martin Creek.

Defoliation will neither be intensive or extensive enough to warrant direct control, at least in 1968.

Sugar pine tortrix, Choristoneura lambertiana (Busck)

The relatively small infestation in Coburn Creek which was detected in 1965 and declined somewhat in 1966, dropped to an even lower level this year. The other infestation in nearby Fall Creek, first reported in 1966 and covering some 1,200 acres, also reverted to a relatively low level. In both areas, feeding damage to its host, lodgepole pine, was too light to be detected, much less delimited, from the air. Followup ground examinations were made in Fall Creek, however, and although the infestation boundary was much reduced in size, tortrix populations were present and some defoliation did occur. Damage was estimated as negligible to light and restricted almost totally to sapling size trees. The insect consumes only the new growth and when population numbers are few, feeding is concentrated in the terminal leaders. Very little information is known on the biology of this insect; consequently, its trend is unknown at this time.

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